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# PATENT ABSTRACTS OF JAPAN

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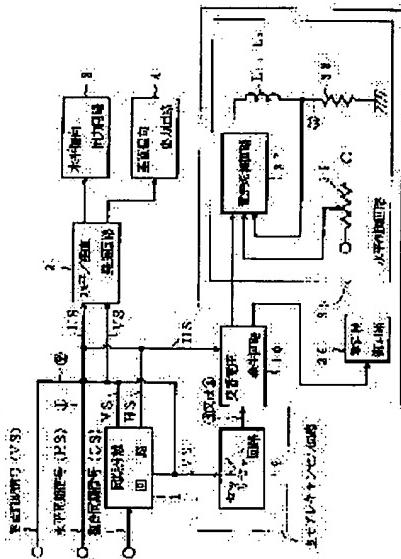
(21)Application number : **04-265087** (71)Applicant : **SONY CORP**  
 (22)Date of filing : **02.10.1992** (72)Inventor : **NISHINO KENJI**

## (54) MOIRE CANCEL METHOD AND DEVICE THEREFOR

### (57)Abstract:

PURPOSE: To reduce a moire, and to simplify a circuit constitution by vibrating three original color electronic beams with a microamplitude by an alternating signal whose level is changed by each line.

CONSTITUTION: A vertical synchronizing signal VS from an outside or a synchronizing separator circuit 1 is supplied to a set/reset circuit 9 constituting a moire cancel circuit 8. The output of the circuit 9 and a horizontal synchronizing signal HS from the outside or the circuit 1 are supplied to an alternating voltage generating circuit 10. Then, the circuit 10 generates an alternating voltage, and a horizontal and vertical alternating magnetic field is generated at coils L1 and L2. Then, three horizontally in-line arranged original color electronic beams are horizontally vibrated a little, and the display position of a color video signal supplied to a color cathode ray tube is horizontally shifted a little by each line. Thus, moire components due to vertical exchange frequency components can be reduced, and a synchronizing disturbance due to the fault of the circuit 8 can be prevented. And also, the circuit 8 can be easily constituted.



### LEGAL STATUS

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the moire cancellation method and equipment which can reduce the moire generated with the color cathode-ray tube which used the shadow mask and the aperture grille.

[0002]

[Description of the Prior Art] In the color cathode-ray tube using the shadow mask or the aperture grille, when the spatial-frequency component of a video signal or the scanning line supplied to this is very as near as the repeat period of the constructional detail of a shadow mask or an aperture grille, a striped pattern (moire) characteristic on the screen of a color cathode-ray tube may occur by both interference.

[0003] As the conventional moire cancellation method, there are how to carry out the phase modulation of the horizontal synchronizing signal, a method of adding reset by the vertical synchronization with the number of horizontal scanning lines, etc.

[0004] With reference to drawing 7, the former moire cancellation equipment is explained below. The composite synchronizing signal (CS) from the outside is supplied to a synchronizing separator circuit 1, and a horizontal synchronizing signal (HS) and a vertical synchronizing signal (VS) are separated. The vertical synchronizing signal (VS) from the outside or the vertical synchronizing signal (VS) from a synchronizing separator circuit 1 is supplied to direct horizontal / vertical oscillator circuit 2.

[0005] The horizontal synchronizing signal (HS) from the outside or the horizontal synchronizing signal (HS) from a synchronizing separator circuit 1 and the vertical synchronizing signal (VS) from the outside, or the vertical synchronizing signal (VS) from a synchronizing separator circuit 1 is supplied to the horizontal synchronizing signal phase modulation circuit 7 where the horizontal synchronizing signal (HS) from the outside or the horizontal synchronizing signal (HS) from a synchronizing separator circuit 1 is supplied to the horizontal scanning line detector 6 which constitutes the moire cancellation circuit 5, and the detection output of the horizontal scanning line detector 6 is supplied to it.

[0006] And the horizontal synchronizing signal (HS) by which the phase modulation was carried out from the horizontal synchronizing signal phase modulation circuit 7 of the moire cancellation circuit 5 is supplied to horizontal/vertical oscillator circuit 2. And while the level oscillation output by which the phase modulation was carried out from horizontal/vertical oscillator circuit 2 is supplied to the horizontal deflection output circuit 3, the perpendicular oscillation output by which a phase modulation is not carried out is supplied to the vertical deflection prime circuit 4, respectively.

[0007] Since the phase modulation of the horizontal deflection signal supplied to the deflecting yoke of a color cathode-ray tube is carried out in this way, generating of the moire on the screen of a color cathode-ray tube and the moire generated on the screen of the color cathode-ray tube like a trinitron (registered trademark) which has a spatial-frequency component horizontally is removable especially. The same is said of the method of adding reset by the vertical synchronization with the above-mentioned number of horizontal scanning lines.

[0008]

[Problem(s) to be Solved by the Invention] However, in order to carry out direct modulation of the horizontal synchronizing signal supplied to horizontal/vertical oscillator circuit, when the modulation circuit breaks down, since a horizontal synchronizing signal is not supplied to horizontal/vertical oscillator circuit, a step-out produces the conventional moire cancellation method mentioned above. Moreover, the moire cancellation method mentioned above cannot reduce moire resulting from a vertical spatial-frequency component, when it applies to the color cathode-ray tube which used also perpendicularly the shadow mask which has a spatial-frequency component.

[0009] In view of this point, this invention tends to propose the moire cancellation method and equipment without a possibility that synchronous disorder may arise by failure of a moire cancellation circuit. Moreover, this invention is level and the thing which is going to propose the moire cancellation method and equipment which can reduce the moire resulting from both number components of perpendicular space waves of a color cathode-ray tube. Furthermore, this invention is level and the thing which can reduce the moire resulting from both number components of perpendicular space waves, and is moreover going to propose the moire cancellation equipment with which circuitry changes simply of a color cathode-ray tube.

[0010]

[Means for Solving the Problem and its Function] the police box signal with which, as for the moire cancellation method of the 1st this invention, level changes for every line synchronizing with a horizontal synchronizing signal -- creating -- the police box signal -- three primary color electron beams -- the predetermined direction -- a minute amplitude -- with, it is made to make it

vibrate

[0011] The 1st this invention sets the moire cancellation method of the 2nd this invention, and it makes the oscillating direction of three primary color electron beams level and a perpendicular direction.

[0012] The 1st this invention sets the moire cancellation method of the 3rd this invention, and it carries out the oscillating direction of three primary color electron beams in the angle direction of 45 degrees of abbreviation to level and a perpendicular direction.

[0013] The moire cancellation equipment of the 4th this invention forms the police box signal generating circuit 10 which generates the police box signal with which level changes for every line synchronizing with a horizontal synchronizing signal. the auxiliary deflection means L1 which deflect three electron beams for the police box signal from the police box signal generating circuit 10, and L2 ; L3 and L4 supplying -- the three primary color electron beams -- the predetermined direction -- a minute amplitude -- with, it is made to make it vibrate

[0014] The moire cancellation equipment of the 5th this invention forms the set / reset-signal generating circuit 9 which generates a set signal and a reset signal by turns for every perpendicular period synchronizing with a vertical synchronizing signal, supplies the set/reset signal from its set / reset-signal generating circuit 9 to the police box signal generating circuit 9, and it is made to reverse the phase of the police box signal from the police box signal generating circuit 9 for every arrival of a vertical synchronizing signal in the 4th this invention.

[0015] The 1st flip-flop circuit 24 to which, as for the moire cancellation equipment of the 6th this invention, a vertical synchronizing signal is supplied in the 5th this invention, as for a set / reset-signal generating circuit 9, It has the noninverting and differential circuits 25 and 26 of the couple which differentiates a reversal output, 27; 28, and 29 and 30. the police box signal generating circuit 10 It both has the 2nd flip-flop circuit 17 to which a horizontal synchronizing signal is supplied and which is set and reset by the differential circuits 25 and 26 of a couple, 27; 28, and the differential output of 29 and 30.

[0016] The moire cancellation equipment of the 7th this invention makes the direction which vibrates three primary color electron beams a horizontal and a perpendicular direction in the 4th or 6th this invention.

[0017] The moire cancellation equipment of this invention of the octavus carries out the oscillating direction of three primary color electron beams in the angle direction of 45 degrees of abbreviation to level and a perpendicular direction in the 4th or 6th this invention.

[0018] It sets to this invention of the 4th or the octavus, and the moire cancellation equipment of the 9th this invention is the auxiliary deflection means L1 and L2. ; L3 and L4 It considers as an auxiliary magnetic-deflection means.

[0019] the moire cancellation equipment of the 10th this invention -- the 9th this invention -- setting -- the auxiliary magnetic-deflection means L1 and L2 ; L3 and L4 electromagnetism -- a PYURITI means is made to serve a double purpose

[0020]

[Example] Below, with reference to drawing 1 , I will explain the example of this invention in detail. In addition, the detail of the moire cancellation circuit of drawing 1 is shown in drawing 2 , the detail of the level and the perpendicular control circuit of drawing 1 and drawing 2 is shown in drawing 3 , the detail of the video / scanning-line cancellation coil of drawing 1 and the moire cancellation circuit of drawing 3 is shown in drawing 4 and drawing 5 , and the timing chart of signal [ of each part of drawing 1 ] \*\* - \*\* is shown in drawing 6 . The composite synchronizing signal (CS) from the outside is supplied to a synchronizing separator circuit 1, and a horizontal synchronizing signal (HS) and a vertical synchronizing signal (VS) are separated. The vertical synchronizing signal (VS) from the outside or the vertical synchronizing signal (VS) from a synchronizing separator circuit 1 is supplied to direct horizontal / vertical oscillator circuit 2. The horizontal synchronizing signal (HS) from the outside or the horizontal synchronizing signal (HS) from a synchronizing separator circuit 1 and the vertical synchronizing signal (VS) from the outside, or the vertical synchronizing signal (VS) from a synchronizing separator circuit 1 is directly supplied to direct horizontal / vertical oscillator circuit 2. The level oscillation signal and perpendicular oscillation signal from horizontal/vertical oscillator circuit 2 are supplied to the direct horizontal deflection output circuit 3 and a vertical deflection output circuit 4, respectively.

[0021] The horizontal synchronizing signal (HS) from the outside or the horizontal synchronizing signal (HS) from a synchronizing separator circuit 1 is supplied to the police box voltage generating circuit 10 where the vertical synchronizing signal (VS) from the outside or the vertical synchronizing signal (VS) from a synchronizing separator circuit 1 is supplied to the set / reset circuit 9 which constitutes the moire cancellation circuit 8, and the output of a set / reset circuit 9 is supplied to it.

[0022] The police box voltage from the police box voltage generating circuit 10 is supplied to a horizontal and the perpendicular control circuits 35 and 36. The level control circuit 35 is amplified while the police box voltage from the police box voltage generating circuit 10 is supplied to the current amplification circuit 37 and transformed into current. Coil L1 which is attached in the color neck of a cathode-ray tube section, and generates vertical alternating field between the output terminal of this current amplification circuit 37, and grounding as shown in drawing 5 (A) and (B) And the series circuit of L2 (the respectively separate core is looped around) and the series circuit of a resistor 38 are connected. A coil L1 and L2 And the connection middle point of a resistor 38 is connected to the input side of the current amplification circuit 37. In addition, drawing 5 (B) is a coil L1 and L2. It is shown independently. Moreover, the potentiometer 39 for zero adjusts is connected to the current amplification circuit 37.

[0023] The perpendicular control circuit 36 has the same composition as the level control circuit 35 except for the coil (L3, L4, and a sign are attached). As shown in drawing 5 (A), it is a coil L3 and L4. A respectively separate core is looped around, it is attached in the color neck of a cathode-ray tube section, and horizontal alternating field are generated.

[0024] A coil L1 and L2 And L3 and L4 A PYURI tee coil is made to serve a double purpose here, it superimposes on a direct

current for a PYURITI amendment at each, and police box current is passed.

[0025] With reference to drawing 2, the concrete circuit of the moire cancellation circuit 8 is explained also with reference to the timing chart of drawing 3. A vertical synchronizing signal (VS) is supplied to the clocked-into terminal creatine kinase of the 1st JK-flip-flop circuit 24 which constitutes a set / reset circuit 9 through a resistor (1kohm) 23. Moreover, horizontal synchronizing signal (HS) \*\* is supplied to the clocked-into terminal creatine kinase of the 2nd JK-flip-flop circuit 17 which constitutes the police box voltage generating circuit 10 through a resistor (1kohm) 16.

[0026] First, the composition of a set / reset circuit 9 is explained. A vertical synchronizing signal VS is supplied to the clocked-into terminal creatine kinase of the JK-flip-flop circuit 24 through a resistor 23, and the set input terminal S and the reset input terminal R are grounded. The direct file of the noninverting output terminal Q of a flip-flop circuit 24 is carried out to the K input terminal K, and the direct file of the reversal output terminal Q (bar) is carried out to the J input terminal J. The noninverting output terminal Q of a flip-flop circuit 24 is connected to the end of a resistor (10kohm) 26, and the cathode of the diode 27 for small signals through a capacitor (1000pF) 25, and the other end of a resistor 26 and the anode of diode 27 are grounded. The reversal output terminal Q of a flip-flop circuit 24 (bar) is connected to the end of a resistor 29, and the cathode of the diode 30 for small signals through a capacitor (1000pF) 28, and the other end of a resistor 29 and the anode of diode 30 are grounded. In addition, a capacitor 25, a resistor 26, a capacitor 28, and a resistor 29 constitute a differential circuit, respectively.

[0027] in this way -- the cathode of diode 27, and the cathode of diode 30 -- every arrival of a vertical synchronizing signal (VS) -- alternation -- set pulse \*\* and reset pulse \*\* -- generating -- each of the 2nd JK-flip-flop circuit 17 -- the set input terminal S and the reset input terminal R are supplied

[0028] Next, the police box voltage generating circuit 10 is explained. A horizontal synchronizing signal is supplied to the clocked-into terminal creatine kinase of the JK-flip-flop circuit 17 through a resistor 16, the direct file of the noninverting output terminal Q is carried out to the K input terminal K, and the direct file of the reversal output terminal Q (bar) is carried out to the J input terminal J. The noninverting output terminal Q of a flip-flop circuit 17 is grounded through the DC-blocking capacitor (4.7 micro F) 18 through the potentiometers (10kohm) 19 and 20 by which parallel connection was carried out mutually. and the movable terminal of each of those potentiometers 19 and 20 is boiled and supplied to the level control circuit 35 and the perpendicular control circuit 36 through the series circuit of capacitors 31 and 32 and resistors 33 and 34, respectively

[0029] In this way to the noninverting output terminal Q of the JK-flip-flop circuit 17 Synchronize with vertical-synchronizing-signal (VS) \*\*, and it is set for every arrival of set pulse \*\*. The square wave signal of the frequency of the double precision of the horizontal frequency reset for every arrival of reset pulse \*\*, That is, police box voltage (the same wave as police box current \*\* of drawing 3) is obtained, and as this mentioned above, the level control circuit 35 and the perpendicular control circuit 36 are supplied through the series circuit of capacitors 31 and 32 and resistors 33 and 34.

[0030] Next, with reference to drawing 4, the concrete composition of the level control circuit 35 and the perpendicular control circuit 36 is explained. While the input terminal 40 to which police box voltage is supplied through the series circuit of capacitors 31 and 32 and resistors 33 and 34 is grounded through a resistor 41, it is connected to the noninverting input terminal Q of 2 power-supply amplifier 45. The ends of the parallel circuit of the diodes 42 and 43 for small signals by which parallel connection was carried out to opposite direction are connected between the noninverting input terminal Q of amplifier 45, and an inversed input terminal Q (bar). The power supply of +5V and -5V is connected to this amplifier 45. The ends of the potentiometer 39 for zero adjustments are connected to amplifier 45, and the movable terminal is connected to the power supply of -5V through a resistor 50.

[0031] + The series circuit (bias circuit) of resistors 46, 47, 48, and 49 is connected between the power supplies of 5V and -5V. The collector of the NPN form transistor 51 is connected to the power supply of +5V, and the base is connected to the connection middle point of resistors 46 and 47. The collector of the PNP form transistor 53 is connected to the power supply of -5V, and the base is connected to the connection middle point of resistors 48 and 49. The series circuit of resistors 52 and 54 is connected between each emitter of transistors 51 and 53, and the connection middle point is connected to the anode of diode 56, and the cathode of diode 57 through a resistor 55. In addition, these diodes 56 and 57 are the diodes for protection and electric discharge.

[0032] The connection middle point of diodes 56 and 57 is grounded through a series circuit, a coil L1, L2 (L3 and L4), and Resistors 38a and 38 38b, i.e., resistors. And the connection middle point of Resistors 38a and 38b is connected to the inversed input terminal Q of amplifier 45. And police box current \*\* shown in drawing 3 is passed by a coil L1 and L2 (L3 and L4).

[0033] Police box current \*\* is a coil L1 and L2. If it flows to a series circuit, vertical alternating field will occur in the color neck of a cathode-ray tube section. Three primary color (red, green, blue) electron beams of level in-line arrangement It is slightly shaken at a longitudinal direction and the moire by the level spatial-frequency component is reduced by what the display position of the color video signal supplied to a color cathode-ray tube is slightly shifted by right and left for for every line (the amount can carry out adjustable by adjustment of a potentiometer 19). Moreover, police box current \*\* is a coil L3 and L4. If it flows to a series circuit, alternating field horizontal to the color neck of a cathode-ray tube section will occur. three electron beams 8 of level in-line arrangement It is slightly shaken in the vertical direction and the moire by the perpendicular spatial-frequency component is reduced by what the display position of the color video signal supplied to a color cathode-ray tube is slightly shifted for up and down for every line (the amount can carry out adjustable by adjustment of a potentiometer 20).

[0034] The coil L1 which generates the alternating field of level and a perpendicular direction in \*\*\*\*, and L2 And L3 and L4 Although it is the case where it prepares in the color neck of a cathode-ray tube section Form level and the coils (the core is looped around, respectively) La and Lb of a couple which generate the alternating field of the direction of 45 degrees to a perpendicular direction in the color neck of a cathode-ray tube section, and above-mentioned police box current \*\* is passed to

this. You may make it vibrate three electron beams slightly towards 45 degrees of abbreviation to level and a perpendicular direction. In this case, what is necessary is just to prepare one control circuit instead of an above-mentioned horizontal and the perpendicular control circuits 35 and 36.

[0035]

[Effect of the Invention] According to the moire cancellation method of the 1st this invention of the above-mentioned \*\*\*\*\*, there is no possibility that synchronous disorder may arise by failure of a moire cancellation circuit.

[0036] [0037] which can reduce [ according to above-mentioned \*\*\*\*\* 2nd and the 3rd this invention ] level and the moire resulting from both number components of perpendicular space waves of a color cathode-ray tube in addition to the effect of the 1st this invention According to the moire cancellation equipment of the 4th this invention, there is no possibility that synchronous disorder may arise by failure of a moire cancellation circuit.

[0038] according to the moire cancellation equipment of the 5th and 6th this inventions, since a position gap of the screen of a color cathode-ray tube grows into an opposite direction mutually in the odd number field and the even number field in addition to the effect of the 4th this invention, the position gap cannot be easily conspicuous and changes

[0039] According to the moire cancellation equipment of the 7th or 9th this invention, it is the 4th or 6th book.

[0040] according to the moire cancellation equipment of the 10th this invention -- auxiliary deflection means -- electromagnetism -- since the PYURITI means was made to serve a double purpose, the auxiliary deflection means of exclusive use are made unnecessary, and composition changes simply

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**CLAIMS**

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[Claim(s)]

[Claim 1] the police box signal with which level changes for every line synchronizing with a horizontal synchronizing signal -- creating -- this police box signal -- three primary color electron beams -- the predetermined direction -- a minute amplitude -- with, the moire cancellation method which carries out the feature of having made it make it vibrate

[Claim 2] The oscillating direction of three above-mentioned primary color electron beams is the moire cancellation method according to claim 1 characterized by being level and perpendicular.

[Claim 3] The oscillating direction of three above-mentioned primary color electron beams is level and the moire cancellation method according to claim 1 characterized by being the direction of the angle of 45 degrees of abbreviation to a perpendicular direction.

[Claim 4] the auxiliary deflection means which prepare the police box signal generating circuit which generates the police box signal with which level changes for every line synchronizing with a horizontal synchronizing signal, and deflect three electron beams for the police box signal from this police box signal generating circuit -- supplying -- this -- three primary color electron beams -- the predetermined direction -- a minute amplitude -- with, the moire cancellation equipment which carries out the feature of having made it make it vibrate

[Claim 5] Moire cancellation equipment according to claim 4 characterized by preparing the set / reset-signal generating circuit which generates a set signal and a reset signal by turns for every perpendicular period synchronizing with a vertical synchronizing signal, supplying the set/reset signal from this set / reset-signal generating circuit to the above-mentioned police box signal generating circuit, and making it reverse the phase of the police box signal from the above-mentioned police box signal generating circuit for every arrival of a vertical synchronizing signal.

[Claim 6] The above-mentioned set / reset-signal generating circuit are [ the 1st flip-flop circuit to which a vertical synchronizing signal is supplied, and ] the moire cancellation equipment according to claim 5 characterized by noninverting and having the differential circuit of the couple which differentiates a reversal output, and both equipping the above-mentioned police box signal generating circuit with the 2nd flip-flop circuit to which a horizontal synchronizing signal is supplied, and which is set and reset by the differential output of the differential circuit of the above-mentioned couple.

[Claim 7] The direction which vibrates three above-mentioned primary color electron beams is the claim 4 characterized by being level and perpendicular, or moire cancellation equipment given in either of 6.

[Claim 8] The oscillating direction of three above-mentioned primary color electron beams is level, and the claim 4 characterized by being the direction of the angle of 45 degrees of abbreviation to a perpendicular direction or moire cancellation equipment given in either of 6.

[Claim 9] The above-mentioned auxiliary deflection means are the claim 4 characterized by being an auxiliary magnetic-deflection means, or moire cancellation equipment given in either of 8.

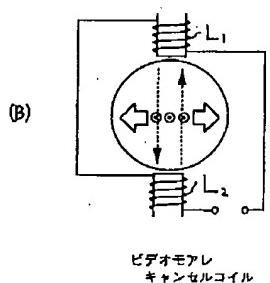
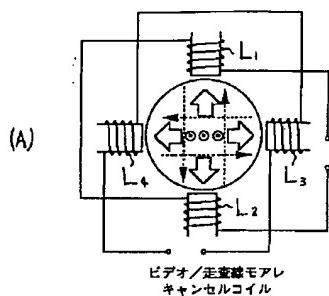
[Claim 10] the above-mentioned auxiliary magnetic-deflection means -- electromagnetism -- the moire cancellation equipment according to claim 9 characterized by making a PYURITI means serve a double purpose, and changing

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[Translation done.]

Drawing selection [Representative drawing] ▼

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